BEFORE THE
FEDERAL COMMUNICATIONS COMMISSION
WASHINGTON, D.C. 20554

In the Matter of	)	
	)	
Revision of the Commission's Rules	)	CC Docket No. 94-102
To Ensure Compatibility with	)	
Enhanced 911 Emergency Calling Systems	)	

To: The Commission, *en banc*

OPPOSITION OF GRAYSON WIRELESS
TO NEXTEL REQUEST FOR WAIVER

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January 5, 2001

SUMMARY OF POSITION

Nextel's request for waiver of the E-911 Phase II implementation schedule fundamentally rests upon the incorrect claim that no compliant Automatic Location Information (ALI) product is available for the iDEN air interface employed in Nextel's network. In fact, the Geometrix™ network overlay system developed by the Grayson Wireless division of Allen Telecom supports iDEN and has done so since 1999. Geometrix™ meets or exceeds the Commission's accuracy and capacity requirements for Phase II and can be deployed by Nextel in compliance with the Commission's existing Phase II schedule. Grayson Wireless has made Nextel fully aware of the availability and capabilities of Geometrix™ and has repeatedly attempted to interest Nextel in field testing. However, for undisclosed reasons Nextel has declined to do so.

In the *Fourth Memorandum Opinion & Order* the Commission expressly ruled that a waiver of Phase II requirements is not warranted and would not be granted if an ALI solution is available to the carrier and is feasible, even if it is not the carrier's preferred solution. No matter how much Nextel contends to the contrary, that is *exactly* the circumstance presented by its waiver request. Accordingly, Nextel's waiver request is without merit and should be promptly denied.

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GRAYSON WIRELESS DIVISION of ALLEN TELECOM INC. ("Grayson Wireless"), pursuant to Public Notice DA 00-2704 released December 4, 2000, hereby opposes the request for waiver of Section 20.18 of the Commission's rules contained in the Report on Phase II Location Technology Implementation submitted in the captioned proceeding by Nextel Communications, Inc. and Nextel Partners, Inc. (collectively "Nextel") under date of November 9, 2000.[1] Grayson Wireless respectfully submits that Nextel's request misperceives the standard for grant of a Phase II waiver established by the Commission in the *Fourth Memorandum Opinion and Order* herein,[2] and is otherwise factually unwarranted. Accordingly, Nextel's Waiver Request should be promptly denied.

In opposition to the Waiver Request, Grayson Wireless respectfully shows:

[1] Nextel Communications, Inc. and Nextel Partners, Inc. Joint Report on Phase II Location Technology Implementation and Request for Waiver, CC Docket No. 94-102, dated November 9, 2000 (the "Waiver Request").

[2] *Revision of the Commission's Rules To Ensure Compatibility with Enhanced 911 Emergency Calling Systems (Fourth Memorandum Opinion and Order)*, 2000 FCC Lexis 4725 (FCC 2000) (the "*Fourth MO&O*").

Background

In the *Fourth MO&O* the Commission forcefully reaffirmed its commitment to rapid implementation of Automatic Location Identification (ALI) technology by wireless carriers in order to comply with the mandates of the Wireless Communications and Public Safety Act of 1999, Pub. L. No. 106-81, enacted October 26, 1999. To this end, the Commission maintained its previously-established Phase II implementation schedule for carriers choosing a network overlay solution, while making adjustments to the schedule for carriers choosing a handset-based technology. According to the Commission, the adjustments were appropriate in order to accommodate the current state of development of handset-based ALI technology.

The Commission further acknowledged the possibility that waivers of the modified schedule may nonetheless be necessary in limited circumstances; and it established a stringent standard by which any such requests would be evaluated. Applying that standard to the three waiver requests then pending before it, the Commission denied the requests by Sprint and by United States Cellular Corp. as insufficiently supported. On the other hand, the Commission credited the claim by VoiceStream Wireless that ALI technology is not available for the GSM air interface used by it, and thus granted VoiceStream a waiver -- subject to conditions -- to permit it to deploy a hybrid location solution on a modified timetable.

Commissioners Ness and Tristani dissented to the VoiceStream waiver because of their concern that the waiver "invites other carriers to make similar showings" and thus "may have the effect of a rule change" that "in effect, create[s] an alternative Phase II implementation track for carriers inclined to seek new E911 solutions in lieu of prompt deployment under our existing rules." The Commissioners concluded that "Ultimately, we are concerned that in light of today's decision other carriers – whether deploying GSM or other modulation technologies – *may choose*

to focus on seeking a waiver rather than rapidly implementing E911 consistent with our accuracy and deployment requirements." (Emphasis added).

The Nextel Waiver Request

Confirming the predictions of Commissioners Ness and Tristani, Nextel included in its implementation report dated November 9, 2000, a request for waiver of Phase II requirements to enable it to deploy a handset based Assisted Global Positioning System ("A-GPS") location technology pursuant to the following schedule:

(i) initial deployment beginning October 1, 2002 (one year late);

(ii) 10% of new iDEN handsets sold beginning December 31, 2002 (one year late and 60% less than existing requirements);

(iii) 50% of new iDEN handsets sold by December 1, 2003 (eighteen months late);

(iv) 100% of new iDEN handsets sold by December 1, 2004 (two years late); and

(v) 95% of iDEN customer base by December 31, 2005 (on time).

To support its request Nextel asserts (incorrectly, as shown below) that "*all relevant engineering, networking, operational, and economic data point to only one feasible choice,*" *i.e.*, the handset based A-GPS technology it advocates. (Waiver Request at p. 3). (Emphasis added). Nextel asserts (again incorrectly) that it "has access to only one ALI solution that can provide accurate Phase II location information on its iDEN network" (*id.* at p. 8) and that "[e]ven today, there is no location technology solution that has been fully integrated and tested on an iDEN handset or network that meets the Commission's accuracy requirements. (*Id.* at p. 9).

Nextel further asserts that it has taken "'concrete steps . . . to come as close as possible to full compliance'" with existing Phase II rules. (*Id.* at p. 11). Nextel claims that it could find only five possible vendors for its E911 Phase II location needs: one vendor proposing a handset-based solution; three vendors proposing network-based solutions; and a Motorola-proposed E-

OTD solution. (*Id.* at p. 13). According to Nextel, one of the network vendors declined to proceed with development for iDEN because Nextel would not commit to paying for the development or to purchasing a minimum quantity of location-capable units; and a second network vendor (unnamed by Nextel, but presumably referring to Grayson Wireless) allegedly "dropped out of the trial process" in February 2000 because the vendor allegedly "would not have sufficient hardware available for [a] trial within a time frame that would permit Nextel to evaluate it and reach a decision prior to submitting this Report." (*Id.* at pp. 13-14). Therefore, Nextel confined its evaluation efforts solely to (a) Motorola's proposed E-OTD technology; (b) one network-based technology (not Grayson Wireless'); and (c) one handset-based technology (Nextel's preferred choice, notwithstanding that the limited testing to date has been done only on a CDMA handset and CDMA network, and notwithstanding that the technology is not currently available for an iDEN handset or network). Nextel concedes that its chosen "solution" does not exist today; that it will take Motorola until at least second quarter 2001 to develop a prototype iDEN handset with A-GPS capability and to modify the iDEN network infrastructure to support the required over-the-air messaging; and that at least another 18 months will then be required for Motorola's development and production of the commercial A-GPS handset. (*Id.* at p. 9).

Interest of Grayson Wireless

As the record in this proceeding already reflects, Grayson Wireless has invested significant time and expense in developing its Geometrix™ wireless location system.[3] Geometrix™ is a comprehensive ALI product, including hardware, services and support, which fully satisfies the Commission's existing E-911 Phase II accuracy and capacity requirements for network-based

[3] *See, e.g.,* Grayson Wireless, a division of Allen Telecom Inc., June 8, 2000, *Ex Parte* Comments (E-911 Phase II Readiness Update); *Ex Parte* letter dated September 15, 2000; *Ex Parte* submission dated September 27, 2000; Comments of Allen Telecom Inc. in Support of Petition for Reconsideration of VoiceStream Waiver, dated October 10, 2000.

solutions. Grayson Wireless has aggressively advertised and promoted the availability of Geometrix™ in trade publications, at trade shows and on http://www.geometrix911.com, its web site, since the first quarter of 2000.[4] Additionally, representatives of Grayson Wireless have participated in numerous industry conferences and seminars, repeatedly sat for interviews by major trade publications and published numerous articles concerning the availability and capabilities of Geometrix™.

The general availability of Geometrix™ was announced on January 17, 2000; a live, multi-protocol demonstration of the product was conducted at CTIA's "Wireless 2000" trade show on February 28, 2000; and, more recently, multiple field trials of Geometrix™ have been successfully completed with Verizon Wireless in Lexington, Kentucky and in the Northern Virginia suburbs of Washington, DC. Field trials with AT&T Wireless also have been completed in the Seattle, Washington area, and are continuing in Denver, Colorado. Geometrix™ has entered into commercial production in anticipation of carrier demand in 2001 to meet the Commission's E-911 Phase II compliance requirements; and Grayson Wireless is prepared to meet that demand.

Of particular significance herein is the fact that Geometrix™ supports the iDEN air interface utilized by Nextel's network infrastructure, in addition to the more common air interfaces used by other carriers. Geometrix™ has supported iDEN since 1999. Beginning in 1998 and continuing in 1999 and throughout 2000, Nextel has been made aware of Grayson Wireless' development plans for and successful adaptation of Geometrix™ to support iDEN. Grayson Wireless responded affirmatively to Nextel's initial Request for Information in November 1998 and, at Nextel's request, has repeatedly reaffirmed Grayson Wireless' interest in implementing Geometrix™ for Nextel.

[4] Attached as Exhibit A is a specimen advertisement for Geometrix™ representative of advertisements placed in trade publications beginning the first quarter of 2000; and attached as Exhibit B are excerpts from the Geometrix™ web site providing information to interested parties concerning the capabilities and availability of Geometrix™.

Nextel claims in its waiver request that one of the network-based solution vendors (presumably referring to Grayson Wireless) "dropped out of [Nextel's] trial process" in February 2000. While Grayson Wireless does not dispute that it did not have available at the early 2000 date chosen by Nextel some of the equipment elements of the type required for Nextel's specific chosen market venue trial area, the fact is that Grayson Wireless thereafter performed a live demonstration for Nextel of the Geometrix™ capability to locate and track iDEN handsets. Furthermore, Grayson Wireless repeatedly reaffirmed its interest in participating in a trial and in supplying Geometrix™ to Nextel. Nonetheless, for reasons known only to Nextel and not disclosed in its waiver request, Nextel has declined the opportunities offered by Grayson Wireless to perform field or other testing of the Geometrix™ system during the course of the past six months.

By contrast, Southern Communications Services, Inc. d/b/a Southern LINC®, which also has deployed an iDEN-based network, reported to the Commission that "Grayson Wireless has developed an iDEN-compatible solution. Southern observed a demonstration of this solution on Grayson's iDEN test site in mid-September, and the test results appeared positive."[5] Southern LINC® further reported that it "is working to schedule tests of the Grayson solution on its network during the first quarter of 2001" and "expects such testing to last approximately 4-6 weeks and plans to conduct tests in a variety of rural and urban locations." (*Id.*).

Nextel Has Wholly Failed to Justify Grant of a Phase II Waiver

In the *Fourth MO&O* the Commission addressed at length the standard it would employ in evaluating requests for waivers of the Phase II rules.

> In the case of E911, we have recognized that there could be instances where technology-related issues or exceptional circumstances may mean that deployment of

[5] Report on Implementation of Wireless E911 Phase II Automatic Location Identification, CC Docket No. 94-102, November 9, 2000, at p. 4.

> Phase II may not be possible by October 1, 2001, and indicated that these cases could be dealt with through individual waivers as these implementation issues are more precisely identified.*
>
> . . . ALI technologies are already, or will soon be, available that provide a reasonable prospect for carriers to comply with the E911 Phase II requirements. Waivers thus should not generally be warranted, especially in light of the vital public safety benefits of Phase II. In those particular cases where waivers may be justified, however, broad generalized waivers should not be necessary and will not be granted. Rather, we expect waiver requests to be specific, focused and limited in scope, and with a clear path to full compliance. Further, carriers should undertake concrete steps necessary to come as close as possible to full compliance (*e.g.*, selecting ALI technologies or vendors, timely placing orders for necessary equipment, performing other necessary preparatory work) and should document their efforts aimed at compliance in support of any waiver requests. Carriers seeking a waiver will be expected to specify the solutions they considered and explain why none could be employed in a way that complies with the Phase II rules. If deployment is scheduled but for some reason must be delayed, the carrier should specify the reason for the delay and provide a revised schedule.
>
> . . . We expect wireless carriers to work aggressively with technology vendors and equipment suppliers to implement Phase II, and to achieve full compliance as soon as possible.* *Carriers should not expect to defer providing a location solution if one is available and feasible. If a carrier's preferred location solution is not available or will not fully satisfy the rules, in terms of accuracy and reliability or timing, the carrier would be expected to implement another solution that does comply with the rules.* Further, if no solution is available that fully complies, the carrier would be expected to employ a solution that comes as close as possible, in terms of providing reasonably accurate location information as quickly as possible.

Fourth MO&O at ¶¶43-45. (Emphasis added). (*Footnote omitted).

Nextel's Waiver Request thus is expressly foreclosed by the standard established in the *Fourth MO&O*. The rules provide that carriers may comply with Phase II requirements *either* with a network overlay solution *or* with a handset-based solution. Nextel, in contrast, seeks improperly to substitute its own judgment for the Commission's by declaring that *only* a handset-based solution for Phase II will serve the public interest, and then argues from that faulty premise that a waiver is necessary because a handset based solution is not currently available for its deployed iDEN technology.

The fact, however, is that Geometrix™ is a currently available network overlay solution for iDEN technology that will meet Phase II accuracy requirements and can be deployed by Nextel in compliance with the established Phase II deadlines. That fact alone is fatal to Nextel's Waiver Request herein. Moreover, in light of Nextel's explicit obligation to "come as close to full compliance as possible" without seeking a waiver, Nextel cannot be allowed to misapply its own artificially imposed deadlines to avoid testing and implementing solutions such as Geometrix™ that are currently available.[6]

Conclusion

In the *Fourth MO&O* the Commission explicitly ruled that a waiver of Phase II requirements is not warranted and would not be granted if an ALI solution is available to the carrier and is feasible, even if it is not the carrier's preferred solution. No matter how much Nextel attempts to contend to the contrary, that is *exactly* the circumstance presented by its waiver request. Accordingly, Nextel's Waiver Request is wholly without merit and should be promptly denied.

Respectfully submitted,

GRAYSON WIRELESS DIVISION
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January 5, 2001

[6] Nextel attempts to buttress its waiver request by offering to contribute $25 million to PSAP upgrades, contingent upon grant of its waiver request. (Waiver Request at p. 4). This offer is entirely irrelevant to the standard for grant of a Phase II waiver and is superfluous to Nextel's waiver request. Moreover, Nextel's premise in doing so is misplaced as a factual matter. Generally speaking, PSAPs that meet the requirements for Phase I are *already* capable of utilizing the Phase II information provided by the Geometrix™ system and do not need further upgrading to take advantage of the ALI technology provided in Phase II.

A T T A C H M E N T A

(Specimen Geometrix™ Advertisement)

GEOMETRIX™ WIRELESS LOCATION SOLUTION

E911 PRIME LOCATIONS

- FCC Compliant
- Carrier Tested
- In-House Manufacturing
- Cellular and PCS
- Simple and Efficient
- Carrier Controlled
- Supports Enhanced Services

NOW AVAILABLE

Ready for the Real World: Compact, easily deployable, integrated location system. Commercial production 4Q 2000. Supports all major air-interfaces and frequencies in all calling environments.

Allen Telecom's Geometrix™ E911 Wireless Location Solution • network overlay system • meets or exceeds FCC Phase II requirements • easily interfaces with Phase I systems • accurate TDOA or TDOA/AOA measurements • supports AMPS, TDMA (IS-136), CDMA (IS-95), and iDEN systems individually or simultaneously without duplicated equipment • customer and CPNI privacy • world's leading provider of wireless telecommunications equipment • in-house ISO 9001 certified manufacturing • scalable • turnkey system • **Available Now!**

visit www.geometrix911.com or contact us at 1-877-GEO-E911

ALLEN TELECOM ®

A T T A C H M E N T B

(Excerpts From http://www.geometrix911.com/ Web Site)

Home
Geometrix Advantages
Wireless E911 Solution
FCC Requirements
Field Trials
The Geometrix Team
Press Releases/Articles
Upcoming Events
Job Opportunities
Contact Information

Geometrix®

Geometrix is a high-performance, cost effective **Wireless E911 Solution** offered by the Grayson Wireless division of Allen Telecom Inc. (A/T). Geometrix is a comprehensive product, which includes hardware, services and support for successful deployment and operation. **The Geometrix Solution** includes the Locating Equipment, Planning Tools, Manufacturing Capabilities and Life Cycle Support**.**

- **Geometrix** is a network-based location system, which performs well in all environments (urban, suburban and rural). It meets the accuracy and capacity requirements of E911 and other location-based services.
- **Geometrix** solution exceeds all FCC performance requirements.
- **Geometrix** planning tools can accurately predict your location network needs by using a combination of propagation models, terrain and morphology data and location algorithms.
- **Geometrix** hardware is manufactured by Grayson Wireless, a division of Allen Telecom, in its ISO-9001 certified plant in Lynchburg, VA.
- **Geometrix** is provided by A/T, a long standing provider of equipment and services with a reputation for quality and reliability.

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Press Releases/Articles
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Geometrix® Advantages

Seamless Integration Into Current Operations

Geometrix integrates and operates transparently. Your wireless customers will not experience any change in service.

Geometrix supports networks using multiple technologies such as CDMA/AMPS, and transitions seamlessly through network technology transitions.

Geometrix is an unobtrusive E911 solution. It requires no modification or replacement of customer handsets, no additional handset functions, and no end user instructions.

Meets all FCC Requirements

Geometrix exceeds all Federal Communications Commission performance requirements. A/T has the production resources to meet the FCC implementation timeline.

Manufacturing Capabilities

Allen Telecom Inc. is a leading supplier of wireless equipment to the global telecommunications infrastructure market. A/T's eight divisions produce a broad line of wireless infrastructure products from their eleven ISO 9001 certified manufacturing facilities. A/T's Grayson Wireless division produces the Geometrix product line in its Lynchburg, Virginia manufacturing facility. A/T's other divisions also offer network performance products, base station and mobile antennas, filters, combiners, repeaters, amplifiers, duplexers, fiber optic in-building coverage systems and RF engineering solutions to carriers, operators and OEM's in the wireless telecommunications industry.

Company Strength

Allen Telecom Inc. combines over 100 years of wireless

engineering experience with the broadest, most technically advanced product line in the wireless telecommunications equipment industry. More than 2,000 employees have contributed to the growth of the company's eight divisions and are responsible for well over 200 patents and trademarks. In 1998, sales topped $388 million and the company enjoyed a net worth in excess of $250 million. Allen Telecom (ALN), listed on the New York Stock Exchange since 1971, is firmly committed to the public safety and other applications of geolocation systems in response to consumer needs.

Geometrix Home | **Geometrix Advantages** | Wireless E911 Solution
FCC Requirements | Field Trials | The Geometrix Team | Press Releases
Upcoming Events | Contact Information | Allen Telecom | Grayson Wireless

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Wireless E911 Solution: Geometrix®

- Architecture
- Upgradability
- Technology
- Capabilities
- Installation, Operation and Maintenance
- Field Trials and Private Network

Geometrix is the basis for A/T's Wireless Location Solution. Equipment from this product line resides in the carrier's network at base station and MSC locations. The equipment supports AMPS, TDMA (IS-136), CDMA (IS-95), iDEN and dual mode networks. Geometrix fills the needs of the wireless carrier who desires to purchase and operate a location network, or it can be configured as a remotely monitored and controlled system in a service bureau model. Geometrix can also be shared among multiple wireless service providers.

Architecture

The Geometrix Wireless Location Solution is based on a network overlay model. As depicted in the graphic below, Geometrix Wireless Location Sensors (WLS), located at the wireless base stations (BTS), and under control from a central location processor measure features of wireless handsets' radio signals. The WLS units transmit these measurements to the Geolocation Control System (GCS) where the location of the handset is determined and communicated to end user applications.

The Geolocation Control System (GCS) is the Geometrix central location processor. In addition to performing the location determination, the GCS manages, coordinates, and administers the WLS network. Geometrix typically connects to Public Safety Answering Points through existing E911 Phase I support systems.

An external data link to the GCS provides a gateway for the Geometrix maintenance network. The maintenance network provides 24-hour, 7-day total system monitoring, transparent software upgrades, system backup, configuration modifications, and an interface for remote troubleshooting and repair. A custom version of the maintenance interface can connect to existing OA&M systems.

Upgradability

The Geometrix network overlay offers maximum flexibility in scaleable deployment. A carrier may choose to initially deploy Geometrix in those areas with the highest cellular density. Additional WLS units may be added to expand the coverage area as required. The Geometrix system has been designed in a scaleable and upgradeable fashion. The system may be upgraded to accept future air-interfaces, increase coverage, or increase capacity with maximal re-use of existing hardware. In its basic configuration, a typical Geometrix network is capable of providing hundreds of geolocations per second, well in excess of anticipated E911 loadings. As with other aspects of the equipment, capacity can be increased through field installable hardware modules.

Technology

Using proven location techniques of Time Difference of Arrival (TDOA) and Angle of Arrival (AOA), Geometrix provides highly accurate position estimates in a variety of signal environments. Geometrix efficiently provides the desired location accuracy for each type of coverage area by utilizing the combination of location techniques and WLS configurations most appropriate to the area.

Time Difference of Arrival (TDOA)

3-Site TDOA Location

The TDOA technique works by measuring the exact time of arrival of a handset radio signal at three or more separate cell sites. Because radio waves travel at a fixed and known rate (the speed of light), by calculating the difference in arrival time at pairs of cell sites, it is possible to calculate hyperbolas on which the transmitting device is located. As seen in the figure, measurements at two pairs of cell sites (e.g. sites 1 & 2, and sites 1 & 3) create two intersecting hyperbolas indicating the location of the transmitting device. The TDOA technique typically uses existing receive antennas already present at a cell site.

Angle of Arrival (AOA)

Angle of Arrival

The AOA technique determines the direction of arrival of a handset's signal at the cell site. The phase difference of the signal on elements of a calibrated antenna array mounted at the cell site provides the angle of arrival. The intersection of the angles from two or more sites provides the location. The AOA technique determines the direction of arrival of a handset's signal at the cell site. The phase difference of the signal on elements of a calibrated antenna array mounted at the cell site provides the angle of arrival. The intersection of the angles from two or more sites provides the location.

Geometrix TDOA + AOA

Combination of TDOA & AOA

In most applications, Geometrix meets performance requirements using only TDOA sensors. In certain circumstances TDOA sensors are augmented with AOA capability to improve coverage and accuracy. One example of this is the coverage of a rural highway where the cell site arrangement often is in a line along the highway. TDOA-only systems must overcome increased propagation loss for three-site reception. The geometry of the cell site placement challenges both TDOA-only and AOA-only systems. However, a combination of these techniques in Geometrix produces an accurate position calculation from only two sites.

Capabilities

The Geometrix system offers a wide range of configuration options to cost-effectively meet the challenge of providing the required location accuracy in the presence of signal multipath interference and challenging tower placement geometry. Installations can be selected for individual sites from the lowest cost TDOA-only version to the highest performance AOA + TDOA combination. The Geometrix system operates with the optimum mix of sensor types to produce the required accuracy at the lowest overall cost.

Basic Configuration

Using A/T's system planning software, the Geometrix configuration is designed to meet the FCC E911 Phase II accuracy requirements. Our experience shows that a two-

antenna TDOA system can deliver the required accuracy in a major percentage of typical applications. In areas where the location accuracy is affected by high multipath or disadvantaged cell site geometry, Geometrix can employ a variety of techniques to overcome performance challenges.

Multipath

In all applications, Geometrix uses proprietary blind spatial processing algorithms to mitigate multipath and co-channel induced errors. In very high multipath environments, however, these techniques may be augmented by using measurements from four antennas. By taking measurements from four antennas, Geometrix is able to recognize multipath components through spatial processing algorithms, and mitigate their effect on accuracy.

Rural Environments

The other major challenge for a network overlay system is to function well in a rural environment where cell sites are far apart and "hearability" is not always possible from three sites. In this case, Geometrix augments its TDOA approach with AOA. The combination of TDOA and AOA with spatial processing offers the capability to provide accurate locations in such demanding environments. The TDOA + AOA combination can provide the measurements necessary for a location calculation with the desired confidence factor from as few as two sites.

The antennas necessary to measure AOA can be manufactured to be unobtrusive and non-disruptive to existing sites. Through proprietary techniques, the necessary multi-element spacing can be provided in a physical package very similar to currently deployed antennas. Through the well-established capabilities of A/T's Decibel Products Division, these antennas provide the necessary capabilities for location with minimal effect on the operation of the site and effort with respect to leases and zoning considerations.

Applications Support

All Geometrix configurations locate mobile stations by making measurements on the voice/traffic channel slots. This approach allows multiple geolocations to be performed on a mobile station. Rapidly repeated locations allow verification of position, while periodic locations over time allow mobile stations to be tracked. This feature provides the basis for many of the revenue generating location services contemplated for the future.

Geometrix WLS units have been designed with the functionality

and capacity necessary to provide full compliance with the FCC's E911 Phase II requirements. This level of accuracy is sufficient for many other location-based services. However, Geometrix has built into the WLS the necessary upgrade paths to deliver greater accuracy and higher capacity should they be required. The decision as to when to invest in additional location based capabilities to support enhanced services is left with the individual carrier. Only when competition or customers demand these location-based services, it is necessary to invest in the facilities to offer enhanced location-based services only when the carrier's business objectives deem them prudent.

Protocols Supported

The Geometrix products support: AMPS, TDMA (IS-136), CDMA (IS-95), TDMA/AMPS, CDMA/AMPS and iDEN systems in the 800 MHz band and TDMA (IS-136) and CDMA (J-STD-008) in the 1900 MHz band.

Supports Dual Mode Networks

Operation in dual mode networks is supported in Geometrix with no additional equipment at cell sites. A WLS locates analog and digital calls through software based receivers. Geometrix seamlessly provides location on a call which transitions between analog and digital as the call progresses.

Applications Interface

The Geometrix GCS supports industry standard Phase I interfaces. Currently this includes the position determining equipment (PDE) interfaces supported by XYPOINT and SignalSoft. In addition, A/T strongly supports the efforts of the Telephone Industry Association Committee TR45.2 Ad hoc on Emergency Services. This committee is responsible for the development of an industry standard interface between position determination equipment, the wireless network, and the Public Safety Answering Point (PSAP). We believe that this standards development process affords all participants the opportunity to contribute to the developing standard while simultaneously producing an open interface which, if widely supported by wireless carriers, serves to lower implementation costs for Phase II technologies.

In the approaches being developed by the industry standards organizations, the PDE is functionally viewed by the wireless network as a black box. By shielding the wireless network and Phase I solution from the location processing and PDE intra-system messaging, the messaging between the wireless network and the PDE is greatly simplified.

Installation, Operation and Maintenance

The design philosophy behind Geometrix dictates a product that:

- Is easy to install and implement
- Causes minimal impact to the wireless network and its customers
- Is highly reliable with no periodic maintenance
- Automatically detects and isolates faults
- Corrects malfunctions or provides maintenance alarms
- Consists of ruggedized line replaceable units

Physical Attributes

A WLS unit occupies less than one cubic foot of space (19"w x 3.5"h x 18"d). Configurations are available for a variety of environmental and mounting options depending on the requirements of the base station. In the case of a base station in a shelter, the WLS typically is rack-mounted along with the other cell site equipment. For outdoor base stations, the WLS mounts in a weatherproof container. In either case, the WLS operates from standard dc power sources typically found at cell sites. The WLS dissipates less than 200 watts.

Installation

The entire installation and implementation process for Geometrix has been designed to be fast and easy, and to seamlessly integrate Geometrix with wireless networks. At the base station, the WLS connects to a spare port on the multicoupler and requires only one DS0 equivalent to communicate with the GCS. In locations where the WLS is configured for two-antenna TDOA, no antenna modifications are necessary. In locations configured for four-antenna TDOA, Geometrix generally uses antennas from adjacent cell sectors. Again, no antenna modifications are necessary. Finally, in the case where the TDOA is augmented by AOA, either an additional antenna is mounted, or one of the receive antennas in the cell sector is replaced. In order to simplify this, A/T offers an antenna by Decibel Antennas in which the necessary multi-element spacing is provided in a physical package very similar to the already deployed antennas. The advantage of this approach is an antenna that will have minimal, if any, impact with respect to leases and zoning considerations.

The Geolocation Control System (GCS) is based on commercial computer equipment configured for rack mounting and operation in a typical MSC environment. The GCS is capable of supporting all standard network interfaces for interconnection to wireless networks and to external communications facilities.

Operations, Administration, & Maintenance

The Geometrix system provides internal system monitoring as well as external alarm reporting. The GCS routinely polls the status of all WLS units in the network. If a fault or failure is detected, the GCS can reboot and restart the WLS. If a major fault (e.g. over temperature) is detected, the WLS has a dry contact relay interface available to the base station alarm system.

The GCS is a high availability, fault tolerant server. The GCS self-monitors its internal processes and can restart any or all if necessary. It has redundant hardware functioning in hot standby that in event of failure will resume any or all processing. Status, statistics, and alarm conditions are all logged on the GCS.

A support network constantly monitors all Geometrix systems. This network can be integrated into in-place operation and maintenance (O&M) functions, or can be operated by A/T in a service bureau mode. In the service bureau model, the support center connects to each GCS and monitors every aspect in the system. The network support center provides 24-hour 7-day monitoring of all systems. This center also provides system maintenance functions such as routine backup, software upgrades, and configuration changes. The Geometrix Network operates autonomously from the support network. The support network serves as an oversight and monitoring function, but does not participate in the real time operations involved in position determination.

Field Trials and Private Network

The Geometrix System has been extensively tested in field trials and is available for observation operating in a private network located in Northern Virginia. The private network has five sites, covering an area of approximately 18 square miles. Through extensive data gathering under real-world conditions, the Geometrix technology has proved it will meet and surpass the FCC requirements.

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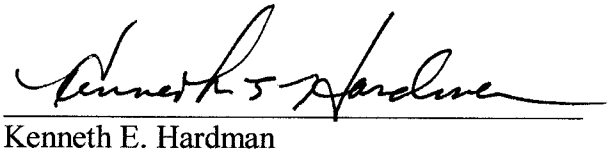
CERTIFICATE OF SERVICE

I hereby certify that I have this day served the foregoing Opposition of Grayson Wireless to Nextel Request for Waiver and annexed attachments upon Nextel Communications, Inc. and Nextel Partners, Inc. by mailing a true copy thereof, first class postage prepaid, to their contact for E911 Phase II deployment, Mr. Lawrence R. Krevor, Senior Director – Government Affairs, Nextel Communications, Inc., 2001 Edmund Halley Drive, Reston, Virginia 20191.

Dated at Washington, DC this 5th day of January, 2001.



Kenneth E. Hardman